

Impact of delay in elective inguinal hernia repair on early clinical outcomes in adults: A single-center observational study

Impact of delay in elective inguinal hernia repair

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Abstract

Aim: In this study, we aimed to demonstrate the short-term clinical outcomes related to the surgical delay of elective inguinal hernia repair based on the observational records of a single center.

Material and Method: Consecutive patients scheduled for elective inguinal hernia repair between March and June 2023 were analyzed. Patients were evaluated in two different groups: early (<3 months) and late (>3 months) repair from the date of diagnosis. Follow-up findings (pre-, intra-, and post-operative) were analyzed for different time intervals to see if surgical delay led to adverse outcomes.

Results: Patients had similar baseline outcomes in terms of pre-existing conditions, surgical techniques and adverse outcomes. Sixteen patients (59.30%) underwent surgery early (<3 months) and 11 patients (40.70%) underwent surgery 3 months after diagnosis. Delay in surgery did not have a significant effect on the outcomes of the patients. Perioperative findings were similar in both groups.

Discussion: Surgical delay does not lead to an increased risk of hernia-related acute life-threatening complications in minimally symptomatic or asymptomatic patients scheduled for elective inguinal hernia repair.

Keywords

Inguinal Hernia, Elective, Repair, Surgical Delay, Clinical Outcome

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Introduction

Inguinal hernia surgery constitutes an important part of the daily practice of the general surgeon [1]. Currently, the gold standard approach is primary repair of the hernia after diagnosis in those with associated symptoms to improve quality of life in the long term and prevent the risk of complications such as incarceration or strangulation [2].

Waiting times until the day of surgery can vary according to various factors. It can sometimes take several weeks or even months due to medical reasons, both patient-related and non-patient-related. This can lead to complications and ultimately the need for emergency surgery. The 'UK National Health Service' (NHS) has stated that the maximum waiting time for elective inguinal hernia repair should not exceed 18 weeks [3]. The COVID-19 pandemic has had a major impact on the dynamics of surgical clinics in terms of the prioritization of surgeries performed. Therefore, elective and non-oncological surgeries were postponed and emergency and oncological procedures were prioritized. Inguinal hernia surgery, like other elective, non-oncologic cases, took its share during this period and some people presented to emergency units with strangulated hernia. It has been reported that the mortality rate can reach 5% in elderly patients operated in the emergency department. In addition, surgery becomes more complex and difficult when the hernia is encountered at a more advanced stage [1, 4].

In this single-center observational study, we investigated whether there was a significant relationship between surgical delay and clinical outcomes in patients with minimal (or no) symptoms awaiting elective inguinal hernia repair based on our clinical findings.

Material and Methods

Consecutive patients older than 18 years who were diagnosed with inguinal and who underwent elective repair hernia between March and June 2023 were selected for the study. Postoperative 30-day findings were recorded for further analysis. Follow-ups were performed by telephone interviews after the first outpatient clinic visit following discharge.

Recurrent inguinal hernias, cases in which inguinal hernia repair was not the main procedure but was performed as an additional procedure, and cases in which laparoscopic inguinal hernia repair was converted to open midline procedures were excluded.

Ethics Committee Approval

The study was carried out with the permission of Istanbul Goztepe Prof. Dr. Suleyman Yalcin City Hospital Clinical Researches Ethics Committee (Date: 2023-02-08, Decision No: 2023/0102).

All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Preoperative Evaluation and Patient Selection

Eligible patients were included in the study after signing an informed consent form. Patients' data were anonymized and collected in a private database. Age, gender, body mass index (BMI), American Society of Anesthesiologists (ASA) rating [5], relevant comorbidities, smoking status, clinical frailty scale, patient's clinical complaint, date of diagnosis, date of surgery,

location of hernia, size of hernia, surgical indication were recorded in the preoperative setting (Table 1).

Operative Findings

The type of anesthesia, the surgeon performing the operation, the diameter of the hernia defect, the surgical approach and the technique used were recorded in the operative setting (Table 1).

Postoperative Findings

Follow-up findings, surgical site infection, length of hospital stay and Clavien-Dindo complication score [6] were evaluated 30 days postoperatively.

Study Endpoints

The aim of the study was to evaluate the clinical impact and feasibility of surgical delay on postoperative outcomes of inguinal hernia patients based on 30-day follow-up findings.

Statistical Analysis

The time from the time of diagnosis to surgery was tabulated as (months). Normal distribution indicators (Shapiro-Wilk and Kolmogorov-Smirnov normality tests) were examined to determine whether parametric or nonparametric analysis methods should be used in the study. It was found that the data were not normally distributed and the Non-parametric Mann-Whitney U Test was used to look for a significant relationship between hernia size and the time (months) from the diagnosis of symptoms to surgery. Pearson's correlation analysis was performed on all remaining data and the relationships between the data, the direction and significance of the relationships were examined. Statistical analysis of the study was performed using SPSS® version 26.0 (IBM, Armonk, New York, USA).

Results

A total of 27 patients (F= 2 (7.4%) / M= 25 (92.6%)) were included in the analysis. Sixteen patients (59.30%) were referred for surgery within 3 months after diagnosis, while the remaining 11 patients (40.70%) were operated on 3 months after diagnosis. The mean age of patients operated early (<3 months) was lower (59 years (23-77)) compared to those operated late (69 years (55-82)).

The majority of operations were performed by surgeons who had performed more than 200 previous inguinal hernia operations; 5 had experience with 0-50 operations and 1 with 101-200 operations.

All participants were followed up by telephone interview after the first outpatient visit and 5 (18.50%) had a 30-day postoperative surgical site infection due to hematoma formation. None of the patients required reoperation. In the early surgery group (<3 months), three patients with a Clavien-Dindo score of 1 and mild surgical site infection were readmitted and treated conservatively.

Comparison of Symptoms and Time from Diagnosis to Surgery

The time from diagnosis to surgery (in months) was recorded and grouped according to the presence or absence of symptoms. According to the test results, no significant difference was observed between the time from diagnosis to surgery (months) and symptoms (U= 41.00, p>.05) (Table 2).

The Relationship Between the Time (Months) from Diagnosis to Surgery and Hernia Size

The hernia size and the time from the time of diagnosis to surgery were analyzed. According to the test results, no

Table 1. Demonstration of patient characteristics from diagnosis to surgery

		Time from diagnosis to surgery (month)				p (month)
		< 3 months		> 3 months		
		N	%	N	%	
Gender	Female	2	7,40%	0	0,00%	0,698
	Male	14	51,90%	11	40,70%	
Age (Average)		59		69		0,412
Height (cm) (Average)		169		170		0,51
Weight (kg) (Average)		78		79		0,004
ASA score (*)	1	7	25,90%	5	18,50%	0,386
	2	5	18,50%	4	14,80%	
	3	4	14,80%	2	7,40%	
Smoking status	Never smoked	5	18,50%	4	14,80%	0,252
	Current smoker or Ex-smoker (<6 weeks ago)	3	11,10%	0	0,00%	
	Ex-smoker (>6 weeks ago)	8	29,60%	7	25,90%	
Clinical Frailty Scale	1-3	16	59,30%	10	37,00%	0,696
	4-6	0	0,00%	1	3,70%	
	7-9	0	0,00%	0	0,00%	
Symptoms	No	2	7,40%	2	7,40%	0,721
	Yes	14	51,90%	9	33,30%	
Operative approach	Open	13	48,10%	9	33,30%	0,652
	Laparoscopic	3	11,10%	2	7,40%	
Size of hernial defect	<1.5 cm	13	48,10%	8	29,60%	0,31
	1.5 - 3.0 cm	1	3,70%	3	11,10%	
	>3.0 cm	2	7,40%	0	0,00%	
Type of repair	Primary repair	1	3,70%	0	0,00%	0,603
	Lichtenstein	11	40,70%	9	33,30%	
	TEP	4	14,80%	2	7,40%	
Suture used to fix the mesh	Non-absorbable	11	42,30%	9	34,60%	0,569
	Tucker	4	15,40%	2	7,70%	
30-day reoperation	No	16	59,30%	11	40,70%	.
	Yes	0	0,00%	0	0,00%	
Clavien-Dindo score	0	11	40,70%	11	40,70%	0,516
	1	5	18,50%	0	0,00%	

*American Society of Anesthesiologists (ASA)

Table 2. Relationship between the time from diagnosis to surgery (months) and symptoms

Measure	Symptoms	N	Rank. Average	Rank. Sum	U	z	p
Time from diagnosis to surgery (months)	None	4	15,25	61,00	41.000	-0,342	,733
	Present	23	13,78	317,00			
	Total	27					

Table 3. Relationship between the time from diagnosis to surgery (months) and hernia size

Measure	Hernia size	N	Rank. Average	Rank. Sum	U	z	p
Time from diagnosis to surgery (months)	Groin limited	24	13,96	335,00	35.000	-0,079	,937
	Scrotum limited	3	14,33	43,00			
	Total	27					

significant difference was observed between the time from diagnosis to surgery (months) and hernia size ($U= 35.00, p>.05$) (Table 3).

Discussion

Inguinal hernia surgery is a safe procedure with low morbidity and mortality rates when considered under elective conditions [1, 7]. In line with this literature information, according to the results of this single-center analysis, surgical delay has no clinically significant effect on intra-operative and post-operative 30-day follow-up findings of inguinal hernia surgeries performed under elective conditions.

It is claimed that the mortality rate of inguinal hernia surgery is over 5% when performed under emergency conditions and less than 1% when performed under elective conditions [8, 9]. These high complication rates of emergency operations have created the perception that inguinal hernia operations should be performed as early as possible after diagnosis, especially in patients with comorbidities and advanced age. Fitzgibbons et al. demonstrated an improvement in quality of life and a modest reduction in pain in patients who underwent elective inguinal hernia repair compared with patients who underwent watchful waiting. However, when both groups of patients were compared in terms of clinical findings obtained at the end of 2 years of follow-up, no significant difference was observed in terms of overall quality of life [10]. In another study conducted by Gallegos et al. [11] on inguinal hernia patients, strangulation developed in 2.8% at 3 months and 4.5% at 2 years. This finding proved that the likelihood of strangulation did not increase at a similar rate according to the time difference.

In a multicenter cross-sectional study analyzing 60038 elective inguinal hernia repairs, contrary to expectations, the COVID-19 pandemic did not lead to a worsening scenario such as increased emergency department visits and life-threatening complications [12]. In an analysis of three randomized, three retrospective and three prospective studies, it was reported that in the long-term follow-up of 858 asymptomatic or minimally symptomatic patients who were followed without surgery, only 2% had hernia-related complications and there was no difference in mortality or postoperative complication frequency [13]. In this study, different time intervals from diagnosis to surgery were recorded. This may be attributed to the fact that for some patients, a small hernia may not have caused enough discomfort to affect quality of life and therefore delayed the decision for surgery. In any case, short waiting times should be targeted to reduce the risk of emergency surgery due to obstruction, which threatens the health of patients, especially those who are older, have comorbidities, and most importantly, present with symptoms that severely impair quality of life [14]. A simple inguinal hernia operation that can be performed under elective conditions may lead to a much more radical procedure as a result of possible intestinal obstruction and even perforation due to strangulation because of the long waiting time. This may result in serious morbidity and mortality rates in the presence of advanced age and comorbidities.

Some limitations of this study should be mentioned. The inclusion of only elective cases in the study leads to a selection bias in the analysis, preventing an objective assessment of the

results presented. In order to draw more consistent conclusions, all patients operated on for inguinal hernia between March and June 2023 should be retrospectively reviewed, and a breakdown of patients who were previously scheduled for elective surgery and those operated on under emergency conditions should be performed. The small sample size is also one of the important limitations preventing the comparison of clinical outcomes. This study focuses on early postoperative outcomes. Therefore, it is not possible to make any inferences about late follow-up outcomes with the present findings. Therefore, this makes the interpretation of the presented findings premature. A prospective and multicenter study with randomized patients would provide more accurate results by revealing the real effect of waiting times on inguinal hernia surgery.

Conclusion

For those with minimal symptoms, a delay in surgery does not lead to a negative outcome that would put the patient's health at risk in short-term follow-up. Therefore, for those who are ineligible for surgery or in cases where the hospital is overcrowded and the number of priority oncology patients is high, hernia patients with these characteristics can be informed in detail and their surgery can be scheduled for a later date. On the other hand, it should not be generalized from the results presented in this study that non-operative follow-up is equivalent to a surgical approach in the management of inguinal hernia. We believe that it is a reliable management strategy in terms of short-term follow-up results only in selected groups of patients who are not suitable for surgery.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Conflict of interest

The authors declare no conflict of interest.

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